

USAID Programs That Address Global Climate Change: *Background Paper*

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USAID Programs That Address Global Climate Change:

Background Paper

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Contents

List of Tables 3

Abbreviations and Acronyms 4

Executive Summary 5

USAID Programs that Address Global Climate Change 7

Background 7

USAID's Climate Change Initiative (CCI) 11

How Much Have We Spent, Where, and on What? 12

Results 16

Conclusion 20

Bibliography 21

List of Tables

| | | |
|----------|--|----|
| Table 1. | Fifteen Countries with the Highest Total and Per Capita CO ₂ Emissions, 1996 | 10 |
| Table 2. | USAID's Climate Change Initiative, 1997: Geographic Focus | 13 |
| Table 3. | USAID Global Climate Change Obligations, FY 1997–2002 | 13 |
| Table 4. | USAID Global Climate Change Primary and Secondary Codes, FY 2000 | 15 |
| Table 5. | USAID Global Climate Change Secondary Codes, FY 2001 | 16 |
| Table 6. | Average Annual Growth Rate of CO ₂ Emissions, USAID's Nine Key Countries, 1988–95 and 1995–96 | 17 |

Abbreviations and Acronyms

| | |
|-----------------|--|
| CDIE | Center for Development Information and Evaluation (USAID) |
| CCI | Climate Change Initiative (USAID) |
| CEM | Reduced Emissions from Energy, Industry, and Urban Sector Activities (Secondary Code) |
| CFC | Increased Participation in the Framework Convention on Climate Change (Secondary Code) |
| CO ₂ | carbon dioxide |
| DA | Development Assistance |
| DCA | Development Credit Authority |
| ECC | Environment Climate Change (Secondary Code) |
| ESF | Economic Support Fund |
| EVCC | Global Climate Change (Secondary Code) |
| °F | degrees Fahrenheit |
| FEWS | Famine Early Warning System |
| FSA | Freedom Support Act (Assistance for the New Independent States of the Former Soviet Union) |
| GAO | U.S. General Accounting Office |
| GCC | Global Climate Change |
| GEF | Global Environment Facility (World Bank) |
| IPCC | Intergovernmental Panel on Climate Change |
| NIS | New Independent States |
| PCF | Prototype Carbon Fund |
| SEED | Support for East European Democracy |
| UNFCCC | UN Framework Convention on Climate Change |
| US-AEP | U.S.-Asia Environmental Partnership |

Executive Summary

The Intergovernmental Panel on Climate Change (IPCC), created by the international community and supported by the United States, is a scientific body that reflects mainstream scientific understanding of climate change. IPCC has concluded that most of the observed global warming of the last 50 years is attributable to human activities, which, if unchecked, could cause the planet's average temperature to rise by as much as 10.4 degrees Fahrenheit (°F) over the next century. Over the last 100 years, average temperature has risen about 1 °F and carbon dioxide (CO₂) levels escalated dramatically, by about 25 percent. Most scientists are convinced that additional human-induced CO₂ emissions (caused mainly by power production, automobile use, and burning of forests) are tilting the balance toward increased global warming.

IPCC believes that global climate change has had an impact on at least 420 physical processes and animal and plant species on all continents (IPCC 2001). Global warming's most prominent manifestations are heat waves, rising seas, melting glaciers, and polar warming. The likely consequences include reduced food production and increased risk of hunger in some regions, increased water scarcity and frequency of drought in some regions, and land losses and flooding in some coastal areas. These climate-induced changes can, in turn, adversely affect human health.

The developed countries are the principal contributors of CO₂ emissions. In 1996, the United States was by far the largest contributor. The developed

countries are also most responsible for the buildup of greenhouse gases, contributing over 85 percent during the last 130 years. However, developing country emissions are on the rise; if current trends continue, developing countries will account for 79 percent of the projected increase in global carbon emissions between 1990 and 2020.

In 1989, Congress directed USAID to pursue a "global warming initiative" through its ongoing environmental assistance programs in energy efficiency, sustainable forestry, urban and industrial pollution prevention, and conservation of biological diversity. The FY 1990 appropriations act added abatement of greenhouse gas emissions to the list of goals to be addressed through energy assistance. In 1997, President Clinton announced that the United States would provide more than \$1 billion during 1998–2002 to help U.S.-assisted countries address climate change.

The Agency's Climate Change Initiative (CCI) emphasizes 1) decreasing the rate of growth of net greenhouse gas emissions, 2) encouraging developing and transition countries to participate in the UN Framework Convention on Climate Change (UNFCCC), and 3) assisting these countries to address problems associated with climate change. It targets nine countries and three regions, selected because they are major contributors to net global greenhouse gas emissions or because their governments are committed to taking concrete action to solve the problem.

The Agency obligated \$168 million in FYs 1998 and 1999 to implement the initiative. USAID

obligations decreased to \$156 million in FY 2000 and held steady at \$158 million in FY 2001. FY 2002 funding is estimated to decrease to \$117 million. Excluding Global Bureau funds, Brazil was the largest recipient of USAID global climate change resources in FY 2000 (\$8.5 million), followed by India and Mexico.

Most USAID CCI activities are designed to produce specific sectoral benefits: for instance, through energy conservation or pollution prevention. Most such activities have a climate change benefit in addition to their specific sectoral benefits. Many are technical assistance programs designed to find cost-effective solutions to problems associated with global climate change.

The president's 2000 *Report to Congress* (White House 2000, 45) stated that USAID exceeded its performance goals for FY 1999, documenting successes in Asia (Philippines, India, and Nepal), Europe and Eurasia (Russia, Ukraine, and Albania), Latin America and the Caribbean (Brazil and Mexico), and Africa (Madagascar and South Africa). The 2000 report and the subsequent 2001 report (White House 2001, 36) noted that USAID-assisted activities

- reduced CO₂ emissions by over 6 million metric tons of carbon equivalent in 1999 and an additional 3.8 million metric tons in 2000
- protected or conserved over 55 million hectares of carbon-storing land in 1999 and 57 million hectares a year later
- led to over 400 policy advances related to global climate change in 1999 (in 2000, the number was 740)
- strengthened the capacity of over 400 public and private organizations and NGOs in 1999 and 990 in 2000

USAID's 1999 *Performance Report* measured the results of USAID activities in global climate change by comparing CO₂ emissions during 1995–96 with a baseline (defined as the average annual rate of change during 1988–95). The results show that CO₂ emissions decreased by an average 1.24 percent per year in all USAID-assisted countries combined during the baseline period. However, CO₂ emissions *increased* by 0.98 percent during 1995–96. USAID target countries (Indonesia, Philippines, Russia, and South Africa) improved their emissions performance. However, this improvement was not necessarily due to USAID programs: in Russia, for example, economic stagnation decreased emissions more than improved environmental technologies and policies.

Six USAID operating units (Egypt, India, Philippines, Romania, U.S.-Asia Environmental Partnership, and the Global Bureau) identified global climate change as one of their strategic objectives in FY 2002. According to their self-assessments, all but Egypt were on track or exceeding expectations.

USAID's experience suggests that its programs affecting global climate change produced significant *outputs*. However, there is little documentation of program impact. As U.S. policy on climate change is reexamined, a key question will be: What is the United States currently doing to address global climate change? An assessment of the results of USAID-funded global climate change programs in developing and transition countries would help clarify and highlight the most effective global climate change interventions.

USAID Programs that Address Global Climate Change

Background

Beginning in the late 1980s, major industrial nations began to face growing pressure from environmental groups to slow global warming. The political pressure multiplied during the hot summer of 1988, first in the United States and then abroad. In response, the international community created a scientific body—the Intergovernmental Panel on Climate Change (IPCC)—to review the evidence. The IPCC, which reflects mainstream scientific understanding of climate change, has become a permanent body supported by the United States.

Global Climate Change in Perspective

Average global temperatures have warmed about 1 degree Fahrenheit (°F) since 1900.¹ The 10 warmest years on record occurred since 1983, seven of them since 1990. The average global temperature in 1998 was the hottest since 1880, when such recordkeeping began.²

Since its inception, IPCC has issued reports summarizing the results of its studies. In 1990, it reported that the effects of global climate change were highly uncertain but could be adverse. In 1995, it reported only a “discernable human influence” on global warming. In its 2000 study, unanimously approved at a UN conference in Shanghai in January 2001, IPCC Working Group 1—charged

with assessing the scientific aspects of climate change—cited “new and stronger evidence that most of the observed warming of the last 50 years is attributable to human activities.” If these human activities go unchecked, the planet’s average temperature could rise as much as 10.4 °F over the next century (IPCC 2001).

What causes global climate change? Scientists point out that the atmosphere acts like a greenhouse. Water vapor, atmospheric gases, and dust particles collect in the atmosphere and, like the glass walls of a greenhouse, trap heat on the earth’s surface. Water vapor accounts for about two-thirds of this greenhouse effect (Smil 2001, 48) and carbon dioxide (CO₂) contributes an estimated quarter of the effect; the balance comes from other gases and particles. For the most part, the greenhouse effect is the result of natural processes, such as volcanic eruptions and the decay of plants—not human activities.

It is normal for the composition and level of greenhouse gases (including CO₂) to change gradually over time. However, during the last century of industrial growth, scientists believe there has been an unprecedented rise in the amount of greenhouse gases, which are considered a principal cause of climate change. Levels of CO₂, the chief manmade greenhouse gas, have escalated dramatically from approximately 290 parts per million about 100 years ago to about 350 parts per million in 1995, an increase of about 25 percent.³

¹ See www.climatehotmap.org/about.html.

² Data from the National Climatic Data Center show how each month’s average surface temperature for both land and oceans diverges from that month’s average in the years from 1880 to 1998. For a graphic depiction of changing global temperatures during 1880–1998, see the *Wall Street Journal* (October 19, 1999, B-1). See John P. Holdren (2000, 27) for a comprehensive discussion of the climate change data and what they mean.

³ The share of human-induced global warming due to CO₂ is 64 percent; methane is the second largest contributor (19 percent), according to J.T. Houghton in *Climate Change 1995: The Science of Climate Change* (1995), cited in the World Resources Institute’s *World Resources: A Guide to the Global Environment*, 1998–99 (1998, 175).

This rapid relative increase in CO₂ coincides with the substantial increase in human population and economic activity during the past 100 years.⁴ Coal and other fossil fuels have been burned to support the industrial and automotive revolutions, and CO₂ has been a major byproduct. Increased emissions of greenhouse gases have also resulted from humans producing and using industrial chemicals for crop and livestock production and from burning and clearing forests that would otherwise serve as natural CO₂ “sinks.” Human activity (mainly power production, automobile use, and burning of forests) adds about 7 billion tons of CO₂ to the air annually—over and above the 200 billion tons that enter the atmosphere from natural sources. The global rate of increase in artificial (manmade) CO₂ emissions was running around 1 percent annually in 1995 (Easterbrook 1995, 22–23).

Most scientists are convinced that this additional human-induced burden is tilting the balance toward global climate change. Even Gregg Easterbrook, an environmental optimist, points out that the scales of earthly climate regulation are delicately balanced, and a very, very small annual addition of CO₂ to the atmosphere may be sufficient to tip those scales in favor of warming. In short, a relatively small addition is not a reason to dismiss global warming concerns.

Manifestations and Consequences of Global Climate Change

The IPCC suggests that global warming has had an impact on no fewer than 420 physical processes and animal and plant species on all continents. What are the manifestations and consequences of global climate change?

Manifestations. The most prominent manifestations of global climate change are heat waves, rising seas,

melting glaciers, and polar warming (Bloomfield, Smith, and Locke 1998).

Examples of heat waves and periods of unusually warm weather include the following:

- *Lhasa, Tibet* had the warmest June on record in 1998. Temperatures hovered above 77 °F for 23 days.
- *Cairo, Egypt* had the warmest August on record in 1998. Temperatures reached 105.8 °F on August 6.
- *Glasgow, Montana* had no subzero days in 1998. For the first time ever, temperatures remained above 0 °F in December, with the average temperature 10.9 °F above normal.

Examples of rising seas and coastal flooding include the following:

- *The Chesapeake Bay* experienced marsh and island loss. The current rate of sea level rise is three times the historical rate. Since 1938, one-third of the marsh at Blackwater National Wildlife Refuge has been submerged.
- *Senegal* experienced a rising sea level. Rising seas are causing the loss of coastal land on the south coast.
- *Bermuda* experienced dying mangroves. Rising sea level is leading to saltwater inundation of coastal mangrove forests.

Examples of melting glaciers include the following:

- *Caucasus Mountains, Russia*, where half of all glacial ice has disappeared in the past 100 years.
- *Spain*, where half of all glaciers present in 1980 are gone.
- *Kenya*, where 92 percent of Lewis Glacier, Mt. Kenya’s largest, has melted in the past 100 years.

⁴As Easterbrook points out, the air contained only a tiny fraction of CO₂ when the increase began. Something that exists in very small amounts may grow dramatically compared to itself, yet remain tiny compared to the larger system. This is what is happening with CO₂. In absolute terms, human-caused emissions of CO₂ have increased the amount of this gas in the atmosphere by 60 parts per million over 100 years; in relative terms, this is only a 0.006 percent increase (Easterbrook 1995).

Examples of polar warming include the following:

- *Barrow, Alaska* has less snow in summer. The number of summer days without snow increased from fewer than 80 in the 1950s to more than 100 in the 1990s.
- *The Arctic Ocean* has shrinking sea ice. The area covered by sea ice decreased by 6 percent from 1978 to 1995.
- *Antarctica* experienced ice shelf breakup. Nearly 1,150 square miles of the Larsen B and Wilkins ice shelves collapsed between March 1998 and March 1999.

Consequences. The likely consequences of global climate change include impacts on the following:

- *Food security.* Currently, 800 million people are malnourished. If the global mean surface temperature increases less than 4.5 °F, global agricultural production might be maintained. However, larger increases in global temperature will likely decrease productivity, particularly in poor countries. In middle-to-high latitudes, agricultural productivity is projected to increase, depending on crop and other factors. Conversely, in the tropics and subtropics, where some crops are near their maximum temperature tolerance and where dryland, nonirrigated agriculture dominates, even small changes in temperature will likely decrease yields, especially in Africa, Latin America, and Asia. In these regions, decreases in overall agricultural productivity of up to 30 percent are projected during the next 50 years. Depending on the affected countries' ability to adapt to climate change, there may be increased risk of hunger in some locations. Mexico and the Indian subcontinent are particularly vulnerable (World Bank 2000a, citing Parry 1997).
- *Water resources.* Currently, 1.3 billion people do not have access to adequate supplies of safe drinking water. About 20 countries, primarily in the Middle East and Africa, are classified as water-scarce or water-stressed. Changes in water stress and water scarcity will depend in part on

climate change (though the main controlling factor will be future growth in water demand). The number of water-stressed countries is expected to double by 2025—even in the absence of climate change. However, water stress and the frequency and magnitude of droughts will likely be exacerbated by climate change in many semi-arid countries (World Bank 2000a, citing Arnell and King 1997).

- *Coastal areas.* About half the world's people live in coastal zones. Climate change will affect coastal systems through sea level rise, which is projected to increase from half a foot to three feet or more during the next 100 years—this compares to 4–10 inches over the past 100 years. Sea level rise makes coastal populations more vulnerable to flooding. Small islands and deltaic areas at the mouths of rivers are particularly vulnerable: with a 1 meter sea level rise, land losses range from 1 percent in Egypt, to 17.5 percent in Bangladesh, and to about 80 percent in the Marshall Islands: potentially displacing tens of millions of people (World Bank 2000a, citing Nicholls 1997). In addition, on average 50–100 feet of beach are lost for every foot of sea level rise (Environmental Defense Fund et al. 1998).
- *Human health.* Because climate change can affect food security, water supply and quality, and ecological systems, it can also affect human health. Indirect health effects could include increases in infectious diseases, such as cholera. The range and season of vector organisms could expand, thus increasing the transmission of vector-borne diseases such as malaria, dengue, and yellow fever. Also, frequent and severe heat waves often lead to increases in heat-related illness, especially in urban areas and among the elderly, the young, the ill, and the poor.

Countries That Produce the Most CO₂

Not surprisingly, industrialized countries, mainly in North America and Europe, are the principal contributors of CO₂. Table 1 lists the 15 countries with the highest emissions of CO₂—emissions

greater than 300 million metric tons per year—in 1996, as well as the 15 countries with the highest per capita CO₂ emissions. Five countries (United States, Russian Federation, Germany, Canada, and Australia) were in both groups; that is, five countries (shown in bold in Table 1) were among the 15 countries with the highest CO₂ emissions in 1996 as measured by both total emissions and per capita emissions. The United States, with 23 percent of

the world's total (5,301.0 million metric tons), was the largest contributor by far.

The developed countries (especially the United States, the European Union, and the former USSR) are also the countries most responsible for the buildup of greenhouse gases over time, contributing over 85 percent of the buildup during the past 130 years (World Resources Institute 1998, 176;

Table 1. Fifteen Countries with the Highest Total and Per Capita CO₂ Emissions, 1996*

| Country | Total CO ₂ Emissions (million metric tons) | Per Capita CO ₂ Emissions (metric tons) |
|------------------------------|--|---|
| United States | 5,301.0 | 20.0 |
| China | 3,363.5 | |
| Russian Federation | 1,579.5 | 10.7 |
| Japan | 1,167.7 | |
| India | 997.4 | |
| Germany | 861.2 | 10.5 |
| United Kingdom | 557.0 | |
| Canada | 409.4 | 13.8 |
| Republic of Korea | 408.1 | |
| Italy | 403.2 | |
| Ukraine | 397.3 | |
| France | 361.8 | |
| Poland | 356.8 | |
| Mexico | 348.1 | |
| Australia | 306.6 | 16.7 |
| United Arab Emirates | | 33.3 |
| Singapore | | 21.6 |
| Trinidad and Tobago | | 17.5 |
| Norway | | 15.3 |
| Saudi Arabia | | 13.8 |
| Czech Republic | | 12.3 |
| Finland | | 11.5 |
| Democratic Republic of Korea | | 11.3 |
| Estonia | | 11.2 |
| Kazakhstan | | 10.9 |
| World | 22,653.9 | 4.0 |

*Note: The original data source, U.S. Department of Energy/Oak Ridge National Laboratories, notes that CO₂ emissions are for fossil fuel burning, cement production, and gas flaring only.

Source: World Bank, *World Development Indicators*, 2000, 142–44.

Panayotou 1999, 5). By contrast, the developing world contributed negligible amounts until the 1930s. During 1990–98, emissions from countries covered under the UN Framework Convention on Climate Change (UNFCCC), taken together, actually decreased by 6 percent. Russia (with its economic collapse) accounted for most of the decrease (47.1 percent) of the decrease among countries with decreased emissions. The United States accounted for most of the increase (60.5 percent) of the increase among countries with increased emissions (Fialka 2000).

During 1990–98, rapid economic expansion and population growth in developing countries resulted in significant increases—34 percent—in greenhouse gas emissions. If current trends continue, developing countries will account for 79 percent of the total projected increase in global carbon emissions between 1990 and 2020.⁵

USAID's Climate Change Initiative (CCI)

At least since the mid-1980s, USAID has been supporting environmental activities in energy efficiency, sustainable forestry, urban and industrial pollution prevention and control, and conservation of biodiversity—all of which have direct effects on reducing greenhouse gas emissions. In 1989, Congress directed the Agency to pursue a “global warming initiative” through its assistance in these environmental activities (GAO 1991). The FY 1990 appropriations act added abatement of greenhouse gas emissions to the list of goals to be addressed through energy assistance. The assistance envisioned in 1990 was to focus on seven key countries (Pakistan, the Philippines, India, Indonesia, Brazil, Mexico, and Poland) and two regions (Central America and Central Africa). In 1991, USAID issued guidance instructing missions to take global warming into consideration when making programming decisions. Since then, USAID has actively managed a portfolio of climate change-related programs.

In June 1997, speaking at the United Nations, President Clinton announced that the United States would spend more than \$1 billion over five years to help developing and transition countries reduce the threat of climate change. USAID was given the lead within the U.S. Government to implement the initiative. The Agency began by developing an action plan, which was released just prior to the third conference of the parties to the UNFCCC in Kyoto, Japan. The action plan spelled out what USAID would do and where it would be done.

The Climate Change Action Plan

Substantive focus. The plan specifies three approaches:

1. Decreasing the rate of growth of net greenhouse gas emissions by decreasing the sources of greenhouse gases, and maintaining or increasing sinks for greenhouse gases. For instance, the sources of greenhouse gases can be reduced by adopting energy production processes that do not burn fossil fuels and thus do not produce CO₂. Carbon can be removed from the atmosphere by planting forests.⁶
2. Encouraging developing and transition countries to participate in the UNFCCC. The more countries committed to reducing greenhouse gas emissions, the greater the likelihood of slowing global warming.⁷
3. Assisting developing and transition countries to deal with the direct threats posed by climate change (such as loss of valuable land and infrastructure, higher production costs, and health problems).

⁶ One analyst has noted there are essentially four causes of global climate change: 1) driving cars that burn fossil fuel; 2) using electricity generated by burning fossil fuels; 3) throwing things away without proper waste management, thereby creating methane; and 4) removing plant cover, including through deforestation. It follows that the key to addressing global climate change lies in changing modes of transportation, promoting energy conservation and efficiency, reducing waste and recycling and using methane, and planting trees. Reducing the use of fossil fuels is clearly at the heart of the matter.

⁷ This emphasis on developing and transition countries is sound. In the United States, it is expensive to achieve further gains because most American generating plants are now highly efficient. This is not the case in developing countries, where less efficient equipment could be improved at far lower cost per ton of CO₂ avoided. It doesn't matter where in the world the gains are achieved if the purpose is to stabilize the global climate.

⁵ From the U.S. Department of Energy's *International Energy Outlook 2000*, cited in USAID's *Climate Change Initiative: Annual Report 1999*.

The first approach (and to a lesser extent, the second) focuses on mitigation of greenhouse gas emissions, which is particularly important for those countries responsible for most of the world's emissions. The third approach focuses on adapting to climate change, which is particularly relevant to developing countries.

The CCI identifies a range of activities for implementing these approaches. These include

- policy reform
- institutional capacity building
- environmental education and outreach
- information collection and dissemination
- application of improved technology
- partnerships with the private sector
- collaboration and coordination with other donors
- loans and loan guarantees to foster private trade and investment in climate-friendly technologies, including clean energy technology
- publicizing the health and productivity costs associated with air pollution caused by fossil fuel combustion

The third approach—adapting to climate change—recognizes that people in most cities do not rank climate change, per se, as a serious problem. People are, however, increasingly concerned about reducing air pollution and lowering production costs. This suggests that governments and donors might usefully focus on investments that improve human health, habitat (for example, by erecting barriers against a rise in sea level)⁸, and save money, since these investments will, at the same time, have a positive effect on climate change.

Geographic focus. The CCI calls for USAID to concentrate resources in nine key countries and three regions. These were selected because, among USAID-supported countries and regions, they are

⁸ For other examples, see Keith Forbes "Impacts of Human-Induced Climate Change on Kazakhstan, the Philippines, and India," December 1998. (PN-ACD-500)

major contributors to net global greenhouse gas emissions and/or their governments are committed to taking concrete action to solve the problem. Altogether, the initiative operates in over 40 countries, including the nine key countries and three regions listed in Table 2.

How Much Have We Spent, Where, and on What?

Table 3 summarizes USAID obligations supporting global climate change activities from FY 1997 (the year before the CCI) through FY 2002.

According to the President's *Report to Congress on Federal Climate Change Expenditures* (White House 2000, 44), USAID obligated \$168.0 million⁹ in FY 1999 (the same as in FY 1998) to support global climate change activities through its "international assistance" programs, one of four program categories identified in the report.¹⁰ USAID obligations decreased to \$156 million in FY 2000, held steady at \$158 million in FY 2001, and are estimated to decrease substantially to \$117 million in FY 2002 (White House 2001). In addition, the Department of State obligated \$7 million annually from FY 1998 through FY 2002 to support global climate change activities through international organizations and programs, and the Department of the Treasury obligated \$60 million in FY 1999 (and \$14 million in FY 2000) to support the World Bank's Global Environment Facility (GEF).¹¹

⁹ According to USAID's budget office, the FY 1999 figure was \$162.0 million: Development Assistance (\$94.8 million); Economic Support Fund (\$19.5 million); Freedom Support Act (FSA) (\$35.5 million); Support for Eastern European Democracy Act (SEED) (\$11.6 million); and Development Credit Authority (\$0.6 million). The \$0.6 million for the Development Credit Authority was transferred from the FSA and SEED accounts and was expected to leverage \$16 million in loan guarantees.

¹⁰ The other three categories are "climate change technology initiative," "U.S. global climate change research program," and "other programs."

¹¹ The GEF was created in 1991. Since beginning regular operations in 1994, it has initiated over 753 projects in 120 countries. The GEF supports five types of climate change-related projects, all but one focused on the energy sector. The GEF has committed about \$2.6 billion to date, 38 percent of which supports climate-related projects, mainly in the clean-energy area (White House 2001, 49). Although the United States supports the GEF, U.S. arrears totaled \$204.2 million in 2000 (White House 2000, 59–60).

Table 2. USAID's Climate Change Initiative, 1997: Geographic Focus

| The "Nine Countries" | The "Three Regions" | | |
|----------------------|----------------------|-----------------|--------------|
| | Central Africa | Central America | Central Asia |
| Brazil | Cameroon | Belize | Kazakhstan |
| India | Central African Rep. | Costa Rica | Kyrgyzstan |
| Indonesia | Dem. Rep. of Congo | El Salvador | Tajikistan |
| Mexico | Republic of Congo | Guatemala | Turkmenistan |
| Philippines | Equatorial Guinea | Honduras | Uzbekistan |
| Poland* | Gabon | Nicaragua | |
| Russia | | Panama | |
| South Africa | | | |
| Ukraine | | | |

* Poland was a key country until USAID closed its program there.

Source: Hales and Koppell 1997

Table 3. USAID Global Climate Change Obligations, FY 1997–FY 2002

(Million Dollars)

| FY 1997 (Actual) | FY 1998 (Actual) | FY 1999 (Actual) | FY 2000 (Actual) | FY 2001 (Actual) | FY 2002 (Est.) |
|---------------------|---------------------|---------------------|---------------------|---------------------|-------------------|
| 147.0 | 168.0 | 168.0 | 156.0 | 158.0 | 117.0 |

Sources: For FY 1997 and 1998: USAID/PPC 1999a and USAID/PPC 1998; for FY 1999: *Report to Congress 2000*; for FY 2000, 2001, and 2002: *Report to Congress 2001*; USAID/M 2000.

The President's 2001 *Report to Congress* indicated that the Agency allocated the \$156.0 million of global climate change assistance among the geographic and central bureaus in FY 2000 as follows: Africa (\$17.5 million), Asia and the Near East (\$30.3 million), Latin America and the Caribbean (\$38.6 million), Europe and Eurasia (\$37.5 million), and Global Bureau (\$30.2 million) (White House 2001, 52–55).

The 2001 *Report to Congress* does not indicate how Global Bureau funds were allocated among countries and regions. However, assuming all Global Bureau funding was used to support CCI global climate change activities in the key countries and regions identified in Table 2, then a total of \$94.2

million (61 percent) of the Agency's global climate change funding was concentrated in these countries. Excluding Global Bureau funds, \$64.0 million (41 percent) of the Agency's FY 2000 global climate change assistance was allocated to the 27 key countries and regions.

Brazil was the largest recipient of USAID global climate change resources in FY 2000 (\$8.5 million), not including Global Bureau funds. The second largest recipient was India (\$8.4 million); the third largest was Mexico (\$8.2 million) (White House 2001, 52–55).

Most activities included under USAID's climate change initiative not only have a climate change

benefit but also have specific sectoral benefits. In strategic objective (SO) parlance, addressing global climate change (one of USAID's five environmental SOs) can be achieved via the other four environmental SOs: energy conservation, urban and industrial pollution prevention, forestry, and—to a lesser extent—protecting biological diversity. For example, investments to encourage energy conservation may also reduce greenhouse gas emissions.

To track and aggregate how USAID funds are obligated sectorally, all USAID-funded activities are classified by a system of primary and secondary codes (USAID/Global 2000b). Until recently, global climate change activities were classified in terms of one primary code and three secondary codes. The primary code covered activities undertaken specifically and explicitly to address climate change. By contrast, the three secondary codes covered activities in a sectoral area (energy, for example), which had the added benefit of affecting climate change. USAID's definitions of primary and secondary codes for global climate change in FY 2000 were as set out in Table 4 (USAID/G 2000b).

The General Accounting Office (GAO) found that USAID's system of coding environmental programs can result in double counting (GAO 1991, 5). For example: assume USAID funds a \$10 million energy conservation project, of which \$2 million also helps address climate change. If the total value of the project is \$10 million, 100 percent cannot be counted as energy conservation and 20 percent simultaneously counted as climate change—because that adds up to more than 100 percent. This problem of clearly distinguishing among various environmental objectives (for example, between global climate change programs and energy conservation programs) was also acknowledged in the Agency's 1999 *Environmental Goal Review* (USAID/PPC 1999). The review pointed out that USAID programs designed to address global climate change—energy efficiency, renewable energy, and clean energy technologies in power generation—may be exactly the same as those designed to promote energy conservation.

Beginning in FY 2001, the Agency's coding system was changed (Lion and Painter 2000). Under the revised system, the primary code for global climate change was eliminated and one secondary code used instead of three (as shown in Table 5). Activities that do not contribute to the CCI are not coded with the Environment Climate Change (ECC) code, even though they may have some climate change benefits. Thus, the new ECC secondary code includes activities that support energy conservation, forestry programs, and other traditional environmental activities if they also contribute to the CCI. This reflects the fact that climate change benefits often result from investments in traditional USAID environmental programs, thereby creating a “win-win” situation.

Many of the climate change-related activities listed under the primary and secondary codes provide technical assistance. This finding is consistent with a November 2000 report published by USAID that lists 162 U.S. Government activities designed to facilitate the transfer of climate-friendly technologies and practices to developing and transition countries (USAID/G 2000c). These activities provide assistance in one or more of seven areas:

- research and development
- investment facilitation
- demonstration projects
- information exchange and dissemination
- regulatory/technical barrier removal
- human and institutional capacity building
- technology verification, assessment, and prioritization

The 162 activities are funded by various U.S. Government agencies, including USAID; the Departments of Energy, State, and Agriculture; and the Environmental Protection Agency.

Table 4. USAID Global Climate Change Primary and Secondary Codes, FY 2000

Primary Code

Global Climate Change (EVCC)

EVCC activities are intentionally and specifically designed to address climate change, and include

- preparing greenhouse gas inventories and action plans
- reducing greenhouse gas emissions from energy supply and use, industrial activity, urban development, or land use
- increasing carbon storage in biomass

Secondary Codes

Reduced Emissions from Energy, Industry, and Urban Sector (CEM)

CEM activities, which “have the added benefit” of addressing climate change, include

- substituting a less carbon-emitting fuel source
- promoting the use of nonfossil renewable energy sources
- increasing efficiency in power generation, transmission, and distribution
- increasing enduser energy efficiency
- decreasing the use or increasing the combustion efficiency of carbon-emitting fuels in transportation
- reducing market barriers to and increasing incentives for more environmentally sound power sector investment
- increasing capture of methane from urban sewage and solid waste
- increasing industrial and municipal adoption of environmental management systems
- creating regulatory frameworks and credit mechanisms that facilitate global climate change-sensitive investments
- increasing industrial and municipal investments in clean technologies
- promoting more environmentally sound infrastructure
- fostering more environmentally sound urban transportation systems

Increased Participation in the Framework Convention on Climate Change (CFC)

CFC activities promote developing country participation in the UNFCCC by

- creating national emissions inventories, baselines, budgets, national action plans, and national communications
- enhancing capacity to track and verify greenhouse gas emissions
- increasing developing country willingness to accept greater commitments under the UNFCCC

Reduced Net Emissions from Land Use Management (CSE)

CSE activities address climate change by

- reestablishing, preserving, or managing forests and other types of vegetation
- maintaining or preserving wetlands and mangroves
- increasing agricultural productivity
- increasing soil organic matter
- decreasing the burning of savanna, rangeland, forest, and brushland
- decreasing soil erosion
- increasing use of biofuels
- improving animal husbandry
- promoting agriculture techniques that sequester carbon
- stabilizing the agricultural frontier

Source: USAID, Emphasis Area Codes: Codes by Goal Area. February 4, 2000.

USAID has supported 88 (54 percent) of the 162 activities designed to address global climate change through technology cooperation. These 88 activities were implemented in four countries in Africa (Egypt, Madagascar, Nigeria, South Africa); three countries in the Asia-Pacific region (India, Indonesia, Philippines); four countries in Europe and Eurasia (Albania, Bulgaria, Kazakhstan, Ukraine); and three countries in Latin America and the Caribbean (Brazil, Guatemala, Mexico). Six of the 88 activities were initiated as early as 1992. But over half (48) began in 1998–2000—after the CCI was announced in 1997. Although the November 2000 publication includes a brief description of each activity, it does not indicate the dollar level of support nor does it assess environmental impact (or results).

Results

The results of USAID’s global climate change assistance programs are reviewed in the Agency’s *Performance Report*, the president’s *Report to Congress*, the Agency’s *Annual Report*, Results Review and Resource Requests (R4s), evaluations, and other documents.

Agency’s Performance Report

USAID’s *Agency Performance Report, 1999* uses the rate of change of CO₂ emissions (measured in metric tons) in USAID-assisted countries—a single indicator—to measure results in the area of global climate change. The Agency compared the rate of change of CO₂ emissions in 1995–96 (the latest period for which data were available) with the average annual rate of change in CO₂ emissions in the 1988–95 baseline period. As shown in Table 6, the average annual growth rate of CO₂ emissions was greater in 1995–96 than in 1988–95 in five of the nine USAID target countries. The five countries that did not improve their emissions performance were Brazil, India, Mexico, Poland, and Ukraine. The four countries that were successful in improving their emissions performance were Indonesia, Philippines, Russia, and South Africa (USAID/PPC 2000, D36).

As pointed out in the 1999 *Agency Performance Report* there are serious problems with using CO₂ emissions as an indicator of the effect of USAID’s

Table 5. USAID Global Climate Change Secondary Codes, FY 2001

Secondary Code

Environment Climate Change (ECC), attributable to the USAID CCI, support:

- increased participation in the UNFCCC
- reduced net emissions from land use management activities
- reduced emissions from energy, industry and urban sector activities

Source: Lion/Painter memorandum, November 6, 2000

programs on global climate change. The main drawback is that reducing CO₂ emissions is not within the Agency’s manageable interest. For example, world fuel prices, structural change, or tax policies can affect a country’s CO₂ emissions—yet all are outside USAID’s manageable interest. Similarly, civil strife, over which USAID has no control, often leads directly to reduced economic activity, which in turn typically leads to lower energy consumption (including that produced by burning fossil fuels). Under these circumstances, dramatic reductions in CO₂ emissions can probably not be attributed to USAID programs.

Moreover, data for CO₂ emissions are normally provided only at the national level, yet USAID often works locally. National-level data do not accurately reflect the results of a few localized programs assisted by USAID. Finally, there is typically a five-year time lag in reporting CO₂ emissions data, which makes an assessment of USAID’s global climate change programs, measured on the basis of CO₂ emissions data, even more problematic.

President’s Report to Congress

The overarching objective of USAID’s climate change initiative was to promote sustainable development in a way that minimized the associated growth of greenhouse gas emissions and reduced vulnerability to climate change in developing nations and countries in transition. According to

the president's 2000 Report to Congress, USAID had exceeded its key performance goals as of FY 1999 (White House 45). This report and the following year's Report to Congress (White House 2001, 36) noted that USAID-assisted activities

- reduced CO₂ emissions by over 6 million metric tons of carbon equivalent in 1999, and by 9.8 million metric tons in 2000
- protected or conserved over 55 million hectares of carbon-storing land in 1999, and 57 million hectares in 2000
- led to over 400 policy advances that either promoted increased participation in the UNFCCC or reduced net greenhouse gas emissions in 1999, and 740 in 2000
- strengthened the capacity of over 400 public and private organizations and NGOs to participate more effectively in the UNFCCC process or to decrease net greenhouse gas emissions in 1999, and 990 in 2000

USAID Environment Center

USAID's Environment Center reports positive results for 1998 and highlights three countries as "success stories" (USAID 2000)

- *Brazil.* USAID's program protected forests on 500,000 hectares of private land.
- *Philippines.* The USAID program encouraged cleaner electricity generation by using natural gas, which reduced by nearly half the greenhouse gas emissions of nine typical 300-megawatt coal-fired units.
- *Russia.* USAID's reforestation program increased seedling production from 6,500 seedlings to more than 1.2 million seedlings in 1997 and 2.5 million seedlings in 1999.

Sectoral Results

In November 2000, a USAID report summarized the results of the climate change initiative in 1999 (USAID/G 2000a) by sector. In 2001, USAID's Climate Change Initiative: Annual Report 1999

Table 6. Average Annual Growth Rate of CO₂ Emissions, USAID's Nine Key Countries, 1988–95 and 1995–99
(In Percent)

| Country | 1988–95 | 1995–96 |
|--------------|---------|---------|
| Brazil | 2.9 | 9.2 |
| India | 5.9 | 10.7 |
| Indonesia | 8.9 | 4.3 |
| Mexico | 3.5 | 5.3 |
| Philippines | 10.0 | 4.0 |
| Poland | –3.6 | 4.8 |
| Russia | –5.3 | –7.5 |
| South Africa | 0.7 | –4.8 |
| Ukraine | –12.2 | –8.8 |

Source: USAID, *Agency Performance Report, 1999*, 125. (See also Note to Table 1.)

reported on climate change achievements by sector for 1999 (USAID/G 2000d). The Annual Report summarized USAID's climate change program results at the country level, complementing the president's Report to Congress, which summarized U.S. Government climate change expenditures. Although the results summarized below are dated, they illustrate how USAID reported on output indicators at the sectoral level.

Forest Conservation and Land Use Management

USAID's programs are designed to protect carbon sinks. According to the November 2000 report, these programs protected or conserved more than 55 million hectares of natural and managed areas (as reported above), initiated over 360 policy advances, and supported 320 capacity building activities involving over 275 organizations (USAID/G 2000a, 3). Illustrative examples include the following:

- *Mexico.* USAID helped protect over 1.75 million hectares of forest by providing park managers with equipment and training.

- *Philippines.* USAID assisted in transferring over 625,000 hectares of forest to local management. After four years, 5.5 million hectares (60 percent of the country's open access forests) were under community management.
- *Nepal.* Over 125,000 hectares of forest have been transferred to 1,600 newly-trained community forest user groups.
- *Madagascar.* Thirty-six community-based associations were granted authority to manage over 225,000 hectares of forestlands.
- *Albania.* USAID's demonstration and training project led to broad replication of new agro-forestry techniques on over 20,000 hectares of forestlands throughout the country.

Energy Sector (Including Industrial and Urban Programs)

USAID programs are designed to reduce CO₂ emissions. In 1999, these programs helped to avoid emission of the equivalent of 2.7 million metric tons of carbon; supported over 170 policy advances to promote energy efficiency, renewable energy, and clean energy production; and funded over 140 capacity building activities involving 516 institutions (USAID/G 2000a, 4). Illustrative examples include the following:

- *Mexico.* A pilot project emphasizing steam and combustion efficiency reduced CO₂ emissions by more than 325,000 metric tons in 1999.
- *India.* By promoting the industrial use of bagasse and biomass fuels, over 0.5 million tons of CO₂ emissions were avoided in 1998.
- *Philippines.* USAID supported adoption of ISO 14000 certification at a Ford Motor Company plant and its chain of 38 suppliers. Fujitsu Ten Corporation (Philippines) followed Ford's lead by applying the same principle to its own suppliers.
- *South Africa.* USAID helped construct 1,470 energy-efficient homes, reducing the need for

heating fuels and avoiding emission of over 200 metric tons of CO₂ per year. These homes serve as models in a country undergoing rapid housing development.

- *Ukraine.* USAID funded a demonstration project to weatherize a boarding school and install heat controls, avoiding 120 tons of CO₂ emissions. The successful program is being replicated in five Ukrainian cities.

UNFCCC Participation

In addition to supporting successful programs in the forestry and energy sectors, USAID supported 124 policy advances in 1999 related to UNFCCC participation and implemented over 70 capacity building activities designed to strengthen developing and transition country participation in the convention (USAID/G 2000d, 27–28). Illustrative examples include the following:

- *Kazakhstan.* USAID helped the government analyze the costs and benefits of greenhouse gas abatement and prepare its national emissions inventory.
- *Philippines.* Through the U.S. Country Studies Program, USAID helped develop a national action plan that called for an inventory of greenhouse gas emissions, assessed vulnerability, and recommended mitigating strategies.
- *India.* With USAID assistance, the Confederation of Indian Industry, the largest trade association in India, established the Climate Change Information Center to facilitate investment in climate-friendly projects.

Adapting to the Impact of Climate Change

USAID has strengthened the capacity of developing and transition countries to adapt to the effects of climate change. Many countries in sub-Saharan Africa are particularly vulnerable to drought and food insecurity caused by climate change. Other countries, especially small island nations, are vulnerable to rising sea levels, another effect of global warming (USAID/G 2000d, 29–30). Illustrative examples include the following:

- *Uganda.* USAID supported the installation of the regional Famine Early Warning System (FEWS) and helped build capacity in rapid rural appraisal and targeting of food aid.
- *Philippines.* USAID helped institutionalize coastal resource management tools and practices in various Filipino organizations, including local governments.

USAID's *Climate Change Initiative: Annual Report 1999* (USAID/G 2000d, 12–13) reports that from 1998 to 1999

- tons of emissions avoided increased by 38 percent
- hectares of carbon stocks protected increased by 4 percent
- policy advances supported increased by 28 percent
- institutions strengthened increased by 8 percent
- capacity building activities increased by 104 percent

These indicators suggest real progress in USAID's efforts to implement the climate change initiative.

Results Review and Resource Requests (R4s)

R4 documents report, among other things, the extent to which performance targets (specified by a USAID operating unit) were met. According to the Agency's R4 database for FY 2002, six USAID operating units (Egypt, India, Philippines, Romania, Global Bureau's Center for Environment, and US-AEP) specified "reducing the threat of global climate change" as a strategic objective. Each operating unit undertook a self-assessment of its global climate change program. According to these self-assessments, four of the ongoing programs were on track, one was exceeding expectations (India), and one had not met expectations (Egypt).

USAID India's FY 2002 R4 includes an annex on global climate change that highlights key results of the mission's greenhouse gas mitigation efforts. It points out, for example, that nearly 1.6 million tons of CO₂ emissions were avoided due to heat rate improvements achieved by coal-based power plants. Similarly, six sugar mills, using only bagasse and biomass fuels, produced 331.2 million kWh of electricity in 1998–99, thereby avoiding 0.5 million tons of CO₂ emissions (as noted above). USAID Philippines' R4 annex on global climate change (and global climate change annexes in R4s submitted by other missions) highlight similar achievements (some of which are reported above as success stories).

Evaluations

USAID's Center for Development Information and Evaluation (CDIE)¹² has completed a series of environmental assessments, most of which were published in 1995 and 1996. These assessments cover the "green" area (forestry, sustainable agriculture, and biological diversity) as well as the "brown" area (energy conservation and urban and industrial pollution).¹³ Each assessment was based on five or six country case studies. However, none of the case studies explicitly examined the effects of these traditional environmental programs on global climate change.

USAID's Development Experience Clearinghouse maintains a database of the Agency's experience (see www.dec.org). When the terms "global warming" and "any evaluations" were used to search the database, only 12 evaluations on global climate change were identified. Of these, eight concerned the program in Brazil. It is possible that global climate change evaluations were carried out, but not submitted to the clearinghouse; non-CDIE evaluations submitted to the clearinghouse decreased from 434 in FY 1993 to only 45 in FY 2002 (USAID 2002). It is also likely that evaluations on climate change simply have not been undertaken.

¹² CDIE is now the Office of Development Evaluation and Information—PPC/DEI.

¹³ *Stemming the Loss of Biological Diversity* (1995), *Forestry and the Environment* (1996), *Agriculture and the Environment* (1996), *Shining the Light on Energy Conservation* (1996), and *Urban and Industrial Pollution Programs* (2002).

Conclusion

USAID's CCI helped developing countries and countries in transition reduce the rate of growth of greenhouse gas emissions, maintain or increase sinks for carbon stocks, support their participation in the UNFCCC, and reduce their vulnerability to the adverse effects of global warming. The experience summarized above identifies significant results and numerous success stories concerning outputs of the Agency's programs that address climate change. However, assessing the impact of these programs is problematic. There are several reasons.

First, there is a serious measurement problem in assessing the impact of any program that purports to reduce global warming. For example, programs that reduce the burning of fossil fuels also reduce CO₂ emissions—which can be measured. However, the effect of reduced CO₂ emissions on global climate change is difficult to measure. One can only assume that reduced CO₂ emissions will contribute to reduced or stabilized global temperatures.

Second, most of USAID's environmental programs emphasize specific sectors such as forestry, energy conservation, and urban and industrial pollution—not climate change per se. These sectoral programs typically were not designed to reduce global warming. (As noted above, CDIE has completed assessments of USAID's programs in most environmental sectors, and addressing climate change was not an explicitly stated objective for any of them.) As such, these programs should not be evaluated against an objective that was not established at the outset. If global climate change was affected, that should be treated as a positive byproduct of the program.

Third, environmental activities that were initiated in direct response to the CCI are generally too recent to evaluate. The CCI was announced in 1997, and most activities did not begin until 1998 at the earliest.

There are different views concerning climate change and how to deal with it—within the United States and between the United States and other

countries (including those of the European Union). These differences became clear in March 2001 when the Bush Administration rejected the Kyoto Protocol, under which industrialized countries would be required to reduce overall emissions of major greenhouse gases by at least 5 percent below 1990 levels between the years 2008 and 2012 (USAID/G 2000d, 7).¹⁴ As the U.S. position on climate change evolves, one of the key questions will be: What is the United States, and in particular USAID, doing to reduce greenhouse gas emissions and address global warming in developing and transition countries? An assessment of these USAID-funded programs would help clarify and highlight the types of global climate change interventions that have been most effective.

Although methodological problems (noted above) make it difficult to measure the impact of environmental programs on climate change, it may be possible to assess the effectiveness of U.S. assistance in a single country where USAID environmental programs related to global climate change are touted as “among the most successful.” An assessment of “the best case scenario” may provide valuable lessons that can be applied in other countries. The assessment would be comprehensive, covering the many types of USAID-funded interventions related to global climate change, and focusing on 1) reducing the sources of greenhouse gas emissions and 2) maintaining or increasing sinks for greenhouse gas emissions. This focus on the two principal ways to mitigate greenhouse gas emissions is consistent with the first element of the CCI. Thus, the assessment would cover not only USAID activities specific to climate change, but also sectoral programs in energy conservation, urban and industrial pollution prevention, and forestry—programs typically not explicitly designed to reduce global warming.¹⁵

¹⁴ See David G. Victor (2000, 45–60) for a cogent article explaining the fundamental logic supporting the president's position.

¹⁵ In response to this recommendation, CDIE sent a three-person team to the Philippines in January 2002 to assess the extent to which four traditional, USAID-funded environmental programs implemented in the 1980s and 1990s had reduced net emissions of greenhouse gases. See “USAID Programs that Respond to Global Climate Change: Philippines Case Study.” (PN-ACS-282)

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